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Art Unit: 2661

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Currently Amended) A method for designing a network in which nodes originate and terminate traffic to keep delay related to node-to-node delay-sensitive communication below a specified threshold, the method comprising:

obtaining an initial network topology including links and traffic routing based on a volume of traffic;

allocating a maximum delay to each link in the network topology in proportion to ~~the~~ a square root of an imputed cost for each of the links ~~link~~;

sizing a bandwidth required for each of the links ~~link~~ based on a current traffic routing and at least one of a maximum delay allocated to the link;

determining link lengths; and

rerouting traffic according to shortest paths with respect to the determined link lengths.

2.   (Original) The method of claim 1, wherein sizing the bandwidth requirement is further based on a total link utilization.

3.   (Currently Amended) The method of claim 1, wherein allocating a maximum delay to each of the links ~~link~~ further provides that ~~so that~~ established delay limits on node-to-node communication are satisfied.

4.   (Currently Amended) The method of claim 1, further comprising repeating all of the steps until ~~the~~ a network design ceases to change.

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5.   (Original) The method of claim 1, wherein the delay allocation, link length and

routing are determined separately for each of a plurality of traffic classes, and wherein link

bandwidths are sufficiently sized for all of the plurality of traffic classes.

6.   (Original) The method of claim 1, further comprising the additional step of

systematically examining the network topology to determine if at least one of eliminating or

adding any given link would reduce a cost of the network.

7.   (Original) The method of claim 5, further comprising the additional step of

systematically examining the network topology to determine if at least one of eliminating or

adding any given link would reduce the cost of the network.

8.   (Currently Amended) The method of claim 5, wherein the sizing step further

comprises determining the sizing of the bandwidth by assigning virtual channels to each of

the plurality of traffic classes, with the bandwidth of each virtual channel being sized

separately and wherein a total bandwidth on the link is based on the a sum of the bandwidths

of the virtual channels as well as on a maximum utilization factor for the links.

9.   (Currently Amended) The method of claim 1, wherein the determining step further

comprises determining the link lengths based on the a marginal cost of the link with respect

to the total traffic that is routed on [[it]] the link by taking the a product of a marginal cost of

the bandwidth with respect to current link bandwidth required and a marginal link bandwidth

required with respect to traffic routed on the link.

10.   (Currently Amended) The method of claim 5, wherein the determining step further

comprises determining the link lengths based on the a marginal cost of the link with respect

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to ~~the~~ total traffic that is routed on [[it]] <u>the link</u> by taking ~~the~~ <u>a</u> product of a marginal cost of

the bandwidth with respect to current link bandwidth required and a marginal link bandwidth

required with respect to traffic routed on the link.

11.   (Currently Amended) The method of claim 10, wherein the ~~determined~~

<u>determining</u> step uses ~~the~~ <u>a</u> same set of link lengths for every class of traffic based on a

weighted sum of the link lengths determined separately for each traffic class.

12.   (Currently Amended) An apparatus for designing a network comprising:

         a database; and

         a module connected with the database that:

                  obtains an initial network topology including links and traffic routing based on

a volume of traffic;

                  allocates a maximum delay to each link in the network topology in proportion

to ~~the~~ <u>a</u> square root of an imputed cost for each link;

                  sizes a bandwidth required for each link based on a current traffic routing and

at least one of a maximum delay allocated to the link;

                  determines link lengths; and

                  reroutes traffic according to shortest paths with respect to the link lengths.

13.   (Original) The apparatus of claim 12, wherein the module sizes the bandwidth

requirement further based on a total link utilization.

14.   (Original) The apparatus of claim 12, wherein the module further allocates the

maximum delay to each link so that established delay limits on node-to-node communication

are satisfied.

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15.   (Original) The apparatus of claim 12, wherein the delay allocation, link length and

routing are determined separately for each of a plurality of traffic classes, and wherein link

bandwidths are sufficiently sized for all of the plurality of traffic classes.

16.   (Currently Amended) The apparatus of claim 12, wherein the module further

determines the ~~sizing~~ size of the bandwidth by assigning virtual channels to each of a

plurality of traffic classes, with a bandwidth of each of the virtual channels ~~channel~~ being

sized separately and wherein a total bandwidth on the link is based on ~~the~~ a sum of the

bandwidths of the virtual channels as well as on a maximum utilization factor for the links.

17.   (Currently Amended) The apparatus of claim 12, wherein the module further

determines the link lengths based on ~~the~~ a marginal cost of the link with respect to ~~the~~ total

traffic that is routed on [[it]] the link by taking ~~the~~ a product of a marginal cost of the

bandwidth with respect to current link bandwidth required and a marginal link bandwidth

required with respect to traffic routed on the link.

18.   (Currently Amended) The apparatus of claim 15, wherein the module further

determines the link lengths based on ~~the~~ a marginal cost of the link with respect to ~~the~~ total

traffic that is routed on [[it]] the link by taking ~~the~~ a product of a marginal cost of the

bandwidth with respect to current link bandwidth required and a marginal link bandwidth

required with respect to traffic routed on the link.

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19.   (Currently Amended) The apparatus of claim 18, wherein the module further

determines ~~the~~ a same set of link lengths for every <u>one of the traffic classes</u> ~~class of traffic~~

based on a weighted sum of the link lengths determined separately for each <u>of the</u> traffic ~~class~~

<u>classes</u>.

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